ZARETSKIY, B. I.

Tractors. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1950. 135 p. (50-55251)

KITAYEV, Ye.N., inzh.; ZARETSKIY, B.I., otv. red.

[The best cements for the manufacture of asbestos-cement materials] Optimal'nye tsementy dlia proizvodstva asbestotsementnykh materialov. Moskva, Otdel nauchno-tekhn.informatsii, 1959. 71 p. (MIRA 15:1)
(Cement) (Asbestos cement)

KITAYEV, Ye.N., inzh.; GONCHARSKAYA, R.E.; ZARETSKIY, B.I., otv. red.; ERLIKH, I.A., red.

[Asbestos cement materials obtained from sand cements by autoclave treatment, and their chemical resistance to corrosive solutions] Khimicheskaia stoikost' v agressivnykh rastvorakh asbestotsementnykh materialov, poluchaemykh iz peschanistykh tsementov s primeneniem avtoklavnoi obrabotki. Moskva, Otdel nauchno-tekhn. informatsii, 1960. 24 p. (MIRA 15:1)

(Asbestos cement)

ZARETSKIY, B.I.

KAREL'SKIKH, D.K., prof.; APASHEV, M.D., kand.tekhn.nauk; BARSKIY, I.B., kand.tekhn.nauk; ZAYCHIK, G.I., doktor tekhn.nauk, retsenzent; ANOKHIN, V.I., kand.tekhn.nauk, retsenzent; ZARETSKIY, B.I., inzh., red.; POPOVA, S.M., tekhn.red.

[Theory, design, and engineering analysis of tractors] Teoriia, konstruktsiia i raschet traktorov. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry. [Pt.3. Theory and analysis of tractor chassis] Teoriia i raschet shassi traktorov. Pod obshchei red. D.K.Karel'skikh. 1950. 144 p. (MIRA 11:12)
(Tractors)

ZARETSKIY, B. I.

"Tractors," Moscow 1950, 1 copy.

L 29931-66 EWP(k)/EWT(d)/EWT(m)/EWP(h)/T/EWP(l)/EWP(v)/EWP(t)/ETI JD/HM

ACC NR: AP6018011 (A) SOURCE CODE: UR/0413/66/000/010/0126/0126

INVENTOR: Voronin, G. I.; Slotin, V. I.; Zaretskiy, B. S.; Krylov, A. I.; Shvetsov, P. N.; Barannikov, G. I.; Eskin, G. I.

ORG: none

40
B

TITLE: Ultrasonic unit for fluxless brazing of metals. Class 49, No. 181967

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 10, 1966, 126

TOPIC TAGS: brazing, metal brazing, ultrasonic brazing, brazing unit

ABSTRACT: This Author Certificate introduces a unit for fluxless brazing of metals equipped with a heater and ultrasonic emitter. To increase efficiency, the ultrasonic

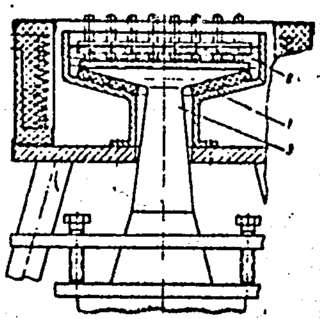

Fig. 1. Fluxless brazing unit

1 - Crucible; 2 - brazing alloy; 3 - ultrasonic emitter.

Card 1/2

UDC: 621.791.351.6.03

L 29931-66

ACC NR: AP6018011

0

emitter is located inside the crucible containing molten brazing alloy, forming the bottom of the latter (see Fig. 1.). Orig. art. has: 1 figure. [AZ]

SUB CODE: 11,13/ SUBM DATE: 29Jan65/ ATD PRESS: 5011

Card 2/2

BAT', G.A.; ZARETSKIY, D.F.

[Solution of the generalized Milne problem] Reshenie obobshchennoi zadachi Milna. Moskva, 1955. 15 p. (MIRA 14:7)
(Neutrons—Scattering) (Integral equations)

ZARETSKIY,D.F.

[Effective boundary conditions for "gray" bodies] Effektivnye granichnye usloviia dlia "serykh" tel; doklady, predstavlennye SSSR na Mezhdunarodnuiu konferentsiiu po mirnomu ispol'zovaniiu atomnoi energii. Moskva, 1955. 17 p. [Microfilm]
(Nuclear physics) (MIRA 9:3)

ZARETSKIY, D. F.

USSR/Nuclear Physics - Thermal neutron capture FD-3260

Card 1/1 Pub. 146 - 19/44

Author : Shut'ko, A. V.; Zaretskiy, D. F.

Title : Capture of thermal neutrons by lead isotopes

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 867-868

Abstract : The authors consider the isotopes Pb-207 and Pb-208 and their excitation levels, spins, parities, energies, etc. They compare the theoretical evaluations of cross-section of thermal neutron capture by lead isotopes with data of experiments. They conclude that capture in Pb-206 is "less single-particle" than in the case of Pb-207, and that the anomalous character of capture radiation in lead isotopes is explained by proceeding from the single-particle picture of capture. The authors thank Professor A. S. Davydov and V. F. Turchin for comments. Seven references, including one USSR: L. K. Peker and L. A. Sliv, Izv. AN SSSR, ser. fiz., 17, 1953.

Institution : --

Submitted : August 31, 1955

ZARETSKIY, D. F. and SHUTKO, A. V.

"On the Thermal Capture by Pb Isotopes" a paper presented at the International Conference on Nuclear Reactions, Amsterdam, 2-7 July 1956.

D551274

Absorption of thermal neutrons by isotopes of lead. A. V. Shut'ko and D. F. Zaretskii. Soviet Phys., JETP 2, 769-71(1956)(English translation).—See C.A. 50, 14378i. B. M. R.

Nuc Sci 2

ZARETSKIY, D.F.

Excitation of collective levels of heavy nuclei by neutrons. D. F. Zaretskii and A. V. [illegible] [illegible] ... upon the nuclei [illegible] ... [illegible] ... collective levels of the nucleus-target is [illegible], if it is not accompanied by compd. nucleus formation. W. I.

AUTHOR ZARETSKIY, D.F., SHUTKO, A.V. PA - 2690

TITLE On the Quasi-Magnetical Interaction of the Nucleon Spin With the Rotation of the Nucleus.
(O kvazimagnitom vzaimodeystvii spina nuklona s vrashchеniyem yadra- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 2, pp 370-371, (U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT It is possible to find a new interpretation for the rotational levels of nuclei with spin 1/2 if we start out from the following premises: (1) In These nuclei there exist Σ-states. Then in first approximation the levels with the total angular momentum $I=K\pm1/2$ are degenerated. (Here K stands for the rotational quantum number). (2) This degeneration is eliminated if we introduce into the Hamiltonian by Bohr and Mottelson an interaction of the form of $H_{Rs} = -(\lambda/mc^2)\,\vec{s}\,[\nabla U\,\vec{v}_{koll}]$ Here λ stands for a non-dimensional phenomenological constant with the same significance and magnitude as in the normal (usual) spin-orbit coupling of the nucleus. Furthermore the following denotations are used: $\vec{s}$ for the vector of the nucleon spin. $U(\vec{r})$ for the selfconsisting potential of the nucleus, mc^2 for the rest energy of the nucleon. and v_{koll} for the velocity with which the nucleon participates in the collective motion. First of all the significance of v_{koll} is clarified, and then the significance and the origin of the above-mentioned interaction H_{Rs}. For the wave function we set

Card 1/2

AUTHORS: Bat', G.A., Zaretskiy, D.F. SOV/89-4-6-2/30

TITLE: The Effective Boundary Value Conditions in the Diffusion Theory of Neutrons (Survey) (Effektivnyye granichnyye usloviya v teorii diffuzii neytronov (Obzor))

PERIODICAL: Atommaya energiya, 1958, Vol 4, Nr 6, pp 510-519 (USSR)

ABSTRACT: In the course of a survey the methods are described by means of which the effective boundary value conditions can be determined which bring about agreement within the asymptotic range between the solution of the neutron diffusion equation and the solution of the corresponding kinetic equation.
The boundary values are described for monoenergetic neutrons; some of them are computed, and, especially, the occurring coefficients are registered in tables for the following cases:

1.) For an infinitely thin "black" rod in a medium, in which sources are uniformly distributed.
2.) For a plane boundary between medium and vacuum by means of the exact analytical method developed by Wiener and Hopf.
3.) For a "black" round cylinder. The following methods of solving are mentioned for this purpose:

Card 1/2

The Effective Boundary Value Conditions in the Diffusion Theory of Neutrons

SOV/89-4-6-2/30

a) The balance method developed by Brudno (1951)
b) The variation method developed by Zaretskiy (Ref 6)
c) The method of spherical harmonics by Galanin
d) Solution of Peierl's (Payerl's) equations for great and small x_0 according to the method developed by Davison.

4.) For a "black" rod of any cross section by the method of approximation developed by Hurwitz (Gurvits) and Roe (Ref 8).

5.) For a "gray" rod (only possible by approximation). If it is intended to take the neutron spectrum into account in connection with the boundary value conditions, this is possible only for some simple border cases.

(A body is described as being either black or gray according to whether the neutrons impinging upon its surface are fully or only partly absorbed). There are 2 figures, 5 tables and 10 references, 4 of which are Soviet.

SUBMITTED: October 4, 1957

1. Neutrons--Diffrusion 2. Diffusion--Theory 3. Mathematics --Applications

Card 2/2

ZARETSKIY, D. F.

"On -Mesonic Fission."

paper to be presented at 2nd Un Intl. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sep 58.

DROZDOV, S. I., ZARETSKIY, D. F., KUERIN, L. P. and SEDELNIKOV, T. Kh.

"On the Formation of a Thermal Neutron Spectrum."

Paper to be presented at 2nd UN Ints. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sep 58.

ZARETSKIY, D.F.

INOPIN, Ye. V.

AUTHOR: Varshalovich, D. SOV/53-65-4-7/13

TITLE: The VIII Annual Congress of Nuclear Spectroscopy (VIII yezhegodnoye soveshchaniye po yadernoy spektroskopii). I

PERIODICAL: Uspekhi fizicheskikh nauk, 1958, Vol 65, Nr 4, pp. 721 - 722 (USSR)

ABSTRACT: The 8th Congress of Nuclear Spectroscopy took place in Leningrad from January 27 to February 3, 1958. It was attended by 300 scientists from the USSR, further by scientists from China, France, Poland, Czechoslovakia, Hungary, Eastern Germany, Yugoslavia, and the Mongol Democratic Republic. 4 main lectures and about 90 reports were heard. The main lectures dealt with problems concerning nuclear models, the α- and β-decay, γ-radiation, internal conversion, and nuclear isomerism. B.S.Dzhelepov, Corresponding Member, Academy of Sciences, USSR, opened the conference. Lectures were held by: V.Yu. Gonchar, Ye. V. Inopin, S.P.Tsytko (FTI,AS UkrSSR) on light nuclei and generalized nuclei models; L.K. Peker (BAN SSSR-Library AS USSR); Yu.M.Shirokov (MGU-Moscow State University), L.A.Sliv (LFTI-Leningrad Physical-Technical Institute) et al. on levels in Mg^{24}, Mg^{25} and Al^{25}; D.S.

Alkhazov, A.P.Grinberg, G.M.Gusinskiy, K.I.Yerokhina and I.Kh.Lemberg (LFTI) on having found no rotational levels at E<1 MeV in Cr, In, and Mn nuclei. The same research workers also reported on the discovery of vibrational γ-levels in W^{182}, W^{184}, W^{186}- nuclei by means of the method of the Coulomb (Kulon) excitation at $E_{exc} \sim 1$ MeV. L.K.Peker

(BAN SSSR) gave a survey report: "Concerning Some Particulars in Vibrational Levels of Deformed Nuclei". Lectures were held also by: D.F.Zaretskiy (AN SSSR - AS USSR) on radiation transitions in deformed nuclei with the spin = 1/2; V.S. Shpinel' 2 NIFI MGU (2nd Scientific Research Institute of Physics, Moscow State University) on the level displacement and the probability of corresponding β - and γ - transitions in odd nuclei; D.F.Zaretskiy (AN SSSR - AS USSR) on the influence of the spin-orbital coupling upon the magnetic moments of the nuclei, A.I.Baz' (AN SSSR -AS USSR) on the existence of light nuclei with high neutron or proton excess; V.A.Kravtsov (LPI-Leningrad Polytechnic Institute) on the formation of nucleon pairs in nuclei; L.L. Gol'din, A. B. Piliye, G.N.Novikova, K.A.Ter-Martirosyan (TTL AN SSSR)

on alpha decay on rotational levels of odd nuclei; V.G. Nosov (AN SSSR - AS USSR) on alpha decay of nonspherical nuclei (survey); A.I.Alikhanov, G.P.Yeliseyev, V.A.Lyubimov, V.V.Krahler (TTL AN SSSR) on polarization measurements at electrons emitted in the β-decay of Tm^{170}, Lu^{177}, Ag^{198}, Sm^{153}, Re^{186} (ΔI= 0,1, ∆π= -1) as well as in that of Sr^{90} and Y^{90} (ΔI= 2, ∆π= -1); V.P.Rudakov (AN SSSR - AS USSR) on measurements of the (β-γ) angular correlations in Ba^{139}-decay; N.A.Burgov and Yu.V.Terekhov (TTL AN SSSR) on investigations of the electron-neutron correlations and the resonance scattering of γ-radiation; B.K.Karimov and Y.N.Nedzhafov (MGU-Moscow State University) on the bremsstrahlung of longitudinally polarized electrons; A.I.Mukhtarov and Yu.M. Perov (MGU) on the effective cross section of the scattering of polarized electrons and positrons at polarized electrons; Ya.E.Chudare and I.Ya.Taure (Riga) on the determination of the intensity of the components of the complex β-spectrum according to the Fermi diagram; I.M.Band, L.N.Zyryanova, and Yu.P.Suslov, LGU (Leningrad State University) on the computation of the probability of the permitted and of the forbidden capture of electrons by a nucleus.

ZARETSKIY, D. F.

21(0) PHASE I BOOK EXPLOITATION SOV/2081

International Conference on the Peaceful Uses of Atomic Energy, 2d., Geneva, 1958

Doklady sovetskikh uchenykh; yadernaya fizika (Reports of Soviet Scientists; Nuclear Physics) Moscow, Atomizdat, 1959. 552 p. (Series: Its: Trudy, Vol. 1) 8,000 copies printed.

Eds. (Title page): A.I. Alikhanov, Academician; V.I. Veksler, Academician; and N.A. Vlasov, Candidate of Physical and Mathematical Sciences; Ed. of this volume: S.I. Breadov and D.F. Zaretskiy, Candidates of Physical and Mathematical Sciences; Ed. (Inside book): G.L. Semlyam; Tech. Ed.: Ye.I. Mazel'.

PURPOSE: This collection of articles is intended for scientific research workers and other persons interested in nuclear physics. The volume contains 43 papers presented by Soviet Scientists at the Second Conference on Peaceful Uses of Atomic Energy, held in Geneva in September 1958.

COVERAGE: It is divided into two parts. Part I contains 17 papers dealing with plasma physics and controlled thermonuclear Reactions, and Part II contains 26 papers on nuclear physics, including problems of particle acceleration and of cosmic ray physics. The first paper by L.A. Artsimovich presents a review of Soviet work on controlled thermonuclear reactions. The remaining papers in Part I deal with particular problems in this field.

papers in Part II deal in detail with various problems in nuclear physics, such as the fission of heavy atoms and their isotopes, and with the study of cosmic radiation by means of artificial earth satellites and rockets, described in a paper by S.N. Vernov. The Russian-language edition of the proceedings of the conference is published in 16 volumes. The first 6 volumes contain all the papers presented by Soviet scientists as follows: Volume (1), Yadernaya fizika (Nuclear Physics); Volume (2), Yadernyye reaktory i yadernaya energetika (Nuclear Reactor and Nuclear Power); Volume (3), Yadernoye goryucheye metally (Nuclear Fuel and Reactor Metals), Volume (4), Khimiya radioelementov i radiatsionnykh prevrashcheniy (Chemistry of Radioelements and of Radiation Transformations); Volume 5, Radiobiologiya i radiatsionnaya meditsina (Radiobiology and Radiation Medicine); Volume (6) Poluchenlye i primeneniye izotopov (Production and Use of Isotopes). The other 10 volumes contain selected papers presented at the Conference by non-Soviet scientists. In the present volume discrepancies between the English and Russian language) edition of the proceedings have been noted in three articles where the texts are not identical; viz; Andrianov, et al, "High Current Pulsed Discharge"; Akhiyezer, et al, "High Frequency Plasma Oscillation"; and Bogolyubov, "Investigations of the Many-body Problem". The serial numbers of reports 2502 and 2504 are reversed in the English edition. Report 2211, by Shmalnikov, et al, is numbered 2536 in the English edition.

TABLE OF CONTENTS:

Reports of Soviet Scientists; Nuclear (Cont.) SOV/2081

AVAILABLE: Library of Congress (QC770. I53 1958)

15

21(1),24(5)

AUTHOR: Zaretskiy, D. F. SOV/56-36-3-34/71

TITLE: On the Theory of Nuclear Magnetic Moments (K teorii magnitnykh momentov yader)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 869-873 (USSR)

ABSTRACT: The important part played by spin-orbit coupling in the theory of nuclear shells is, in general, taken into account by (1) :

$$\mathcal{H}'_{1s} = -(\lambda \hbar/m^2c^2)\,\vec{s}\left[\nabla U \vec{p}\right]$$

(λ = phenomenological spin-orbit coupling constant, $\vec{s}$ = nucleon spin operator, $U(\vec{r})$ = selfconsistent nuclear potential, $\vec{p}$ = momentum operator of the nucleon); if the nucleus is in an electromagnetic field, (1) with $\vec{p} \rightarrow e\vec{a}/c$ goes over into

$$\mathcal{H}' = (\lambda e \hbar/m^2c^3)\,\vec{s}\left[\nabla U \vec{a}\right] \qquad (2)$$

where a is the vector potential. Mayer and Jensen (Ref 1) were the first to point out the necessity of taking this spin-orbit effect into account without, however, using (2).

Card 1/3

D. P. Grochukhin (Ref 2) calculated the spin-orbit coupling for magnetic transitions of the kind $d_{3/2} \rightarrow s_{1/2}$. In the present paper the effect is investigated by which (2) is introduced into the magnetic moment of spherical and non-spherical nuclei with odd proton number. Although (2) is not the only cause of the deviation of the observed magnetic moments from the Schmidt (Shmidt) line, an investigation (estimate) of (2) is nevertheless of interest, because it facilitates separation of the other effects. In some cases (2) makes the main contribution to the deviation of magnetic moments from the Schmidt line as well as to the probability of forbidden M1-transitions for nuclei with an odd proton number. In the case of nuclei with odd neutron numbers, consideration of (2) is of good purpose when there exists an effective charge due to interaction between neutron and the core of the nucleus (cf. Ref 3). In the present paper the additional factor occurring for strong spin-orbit coupling by the interaction between the nucleons in the nucleus and the electromagnetic field is, essentially, calculated for spherical and nonspherical nuclei. For the former the magnetic moment is $\mu = \langle J, J | \hat{\mu}_z | J, J \rangle$

On the Theory of Nuclear Magnetic Moments SOV/56-36-3-34/71

and, in consideration of (2):

$$\mu = \mp \frac{J + \frac{1}{2}}{2(J+1)} \frac{e\hbar}{2mc} \frac{\lambda}{mc^2} \left\langle J \left| r \frac{\partial U}{\partial r} \right| J \right\rangle$$

For Bi^{209} an estimate results in $\mu \approx + 0.6\ e\hbar/2mc$.

For nonspherical nuclei it holds that $\mu = \langle \vec{\hat{\mu}} \vec{J} \rangle /(J + 1)$ and with (2) for spin 1/2 also a formula, (21), is derived. For Tm^{169} this results in $\mu = -0.35$ nuclear magnetons, as against an experimental value of $\mu = -0.20 \pm 0.5$. The author finally thanks P. E. Nemirovskiy for discussions. There are 13 references, 7 of which are Soviet.

SUBMITTED: September 16, 1958

Card 3/3

24(5)

AUTHOR: Zaretskiy, D. F. SOV/56-36-4-26/70

TITLE: On the Radiative Transitions in the System of Rotational Levels of Nuclei With Spin 1/2 (O radiatsionnykh perekhodakh v sisteme vrashchatel'nykh urovney yader so spinom 1/2)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1129-1132 (USSR)

ABSTRACT: For the purpose of calculating the probabilities of magnetic dipole- and electric quadrupole transitions between rotational levels of deformed spin 1/2 nuclei, a coupling system suggested by Hund and already previously used by the author (Ref 1) is used. A transformation of coordinates (transition to the system of coordinates of the nuclear axes) is carried out in the wave function, and by using the relation $\chi_{1/2,m_s} = \sum_{m'_s} D^{1/2}_{m_s m'_s} \chi_{1/2,m'_s}$

Card 1/3

On the Radiative Transitions in the System of Rotational Levels of Nuclei With Spin 1/2

SOV/56-36-4-26/70

a wave function of the form

$$\Psi_{\chi s}^{JM} = \sqrt{(2\ \ +1)/8\pi^2}\ \varphi_0 \sum_{m_s'} (\varkappa \tfrac{1}{2} 0 m_s' | \varkappa \tfrac{1}{2} J m_s')\, D^J_{M,m_s'} \chi_{\frac{1}{2},m_s'}$$

is obtained, which causes no difficulties with respect to calculating the probabilities of electric quadrupole transitions. The result agrees with that obtained by Bohr and Mottelson (Ref 2). (φ_0 denotes the wave function describing the motion of the nucleon with respect to the nuclear axes, χ - the spin function of an odd nucleon in the laboratory system, the rotation quantum number $\varkappa$ assumes the values 0,2,4,... for the states $\sum_g^+$ and 1,3,5,... for $\sum_u^+$. In the following the authors calculate the probabilities of magnetic dipole transitions and show that transitions between components of different doublets with $\Delta J = 1$ occur mainly as magnetic dipole transitions. The admixture of electric quadrupole transitions amounts to not more than 10 - 20 %. In

Card 2/3

On the Radiative Transitions in the System of Rotational Levels of Nuclei With Spin 1/2

SOV/56-36-4-26/70

conclusion, the nucleus Tm^{169} (and Tm^{171}) is shortly investigated as an example, and a comparison is drawn with the results obtained by references 7 and 8 with respect to the nucleus Yb^{171}, the daughter nucleus originating from the β-decay of Tm^{171} (Fig). The author thanks S. A. Baranov for discussing experimental data, and D. P. Grechukhin for his comments. There are 1 figure and 9 references, 3 of which are Soviet.

SUBMITTED: September 13, 1958

Card 3/3

5

ZARETZKIY, D.F.

Radiative capture of a neutron. Zhur.eksp.i teor.fiz. 37 no.4: 1084-1087 O '59. (MIRA 13:5)
(Neutrons--Capture)

16.8100,24.6720,24.6800,24.6810

77009
SOV/56-37-6-49/55

AUTHORS: Zaretskiy, D. F., and Novikov, V. M.

TITLE: Letter to the Editor. Depolarization of Muons in μ-Mesoatoms with Deformed Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1824-1825 (USSR)

ABSTRACT: An analysis was made of the additional depolarization caused by the interaction of muon with nuclear deformation in μ-mesoatoms. The effect was considered for even-even nuclei. The Hamiltonian of the muon-nucleus system was taken in the following form:

$$H = H_0 + H_R + H_q.$$

Here, H_o is the Hamiltonian of the muon in the monopole field; H_R is operator of rotational energy of the

Card 1/4

Letter to the Editor. Depolarization of Muons in μ-Mesoatoms with Deformed Nuclei

77009
SOV/56-37-6-49/55

nucleus; H_q is operator of quadrupole interaction of muon with nucleus. The diagonalization of the Hamiltonian shows that the quadrupole interaction considerably changes the eigen functions of the system with corresponding muon in the 2p-states (cf., L. Wilets, Kong. Dansk. Vidensk. Selsk. Mat.-fys. Medd., 29, 3, 1954). The changes of the eigen functions of other states can be neglected. In such an approximation the polarization of muon in 1s-states becomes:

$$P = A_q W_{1/2} \langle \sigma_{2p_{1/2}} \rangle_0 + B_q W_{3/2} \langle \sigma_{2p_{3/2}} \rangle_0$$

Here $W_{\frac{1}{2}}$ and $W_{3/2}$ are probabilities of the passing of muon through states $2p_{\frac{1}{2}}$ and $2p_{3/2}$; $\langle \sigma_{2p_{\frac{1}{2}}} \rangle_0$ and

Card 2/4

$\langle \sigma_{2p_{3/2}} \rangle_0$ are polarization of muon in the above states in the absence of quadrupole interaction; A_q and B_q are factors compensative of the additional depolarization. The factor B_q was determined from muon transition from the upper levels into the 1s-state through the states that can be described by the eigen function of the above given Hamiltonian:

$$B_q = 0{,}8 \sum_{k=1}^{3} C_k^1 \left[\left(\frac{E_{f.s.} - 3E_k}{3E_q} \right)^2 + 2 \right] - 0{,}6,$$

where

$$C_k^3 = \frac{E_q^2 (E_R + E_q - \frac{2}{3} E_{f.s.} - E_k)^1}{E_q^3 (E_R + E_q - \frac{2}{3} E_{f.s.} - E_k)^2 + E_q^2 (E_q + \frac{1}{3} E_{f.s} - E_k)^2 + [(\frac{1}{3} E_{f.s} -} \to$$

$$\to \frac{E_q^2 (E_R + E_q - \frac{2}{3} E_{f.s.} - E_k)^2}{- E_k)(E_R - \frac{2}{3} E_{f.s} - E_k) - E_q^2]^2}.$$

Letter to the Editor. Depolarization of Muons in μ-Mesoatoms with Deformed

77009
SOV/56-37-6-49/55

Here, E_k is eigen values of the Hamiltonian which correspond to muon in 2p-states and to the whole momentum of the system 3/2; $E_{f.s.}$ is splitting of fine structure of the 2p-level; E_R is energy of the first rotational level of the nucleus; $E_q = \langle 2p | H_q | 2p \rangle$. The following values of B_q and D_q were calculated for Gd^{158}, W^{184}, Th^{232}, and U^{238}, respectively: 0.63, 0.64, 0.38, 0.38 and 0.61, 0.64, 0.6, 0.59. Thus, the interaction of muon with nuclear quadrupole deformation can lead to a considerable additional depolarization of the muon. There are 4 references; 2 Soviet, 1 Dutch, 1 U.S. The U.S. reference is: G. W. Ford, C. J. Mullin, Phys. Rev., 108, 477, 1957.

SUBMITTED: August 21, 1959

Card 4/4

GRIN', Yu.T.; DROZOV, S.I.; ZARETSKIY, D.F.

Green's function for odd nuclei. Zhur. eksp. i teor. fiz. 38 no.1:222-228 Jan '60. (MIRA 14:9)
(Potential, Theory of) (Nuclei, Atomic)

24.6300

27480
S/048/61/025/009/005/007
B104/B102

AUTHORS: Grin', Yu. T., and Zaretskiy, D. F.

TITLE: Collective excitations of non-spherical nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 9, 1961, 1169 - 1175

TEXT: This paper was read at the 9th Annual Conference on Nuclear Spectroscopy. The authors generalize the theory of collective excitations of non-spherical nuclei. An equation is set up for the frequencies of collective nuclear oscillations, and a relation between the frequencies of the excited $\beta(k=0)$ and $\gamma(k=2)$ vibrational levels is derived in quasi-classical approximation. Using the Green's two-particle function $K = \langle \Phi_0 | T(a_1 a_2^+ a_3 a_4^+) | \Phi_0 \rangle$, the equation

$$1 = \varkappa \sum_{12} \frac{(E_1 E_1 - \varepsilon_1 \varepsilon_2 + \Delta^2)}{2E_1 E_2 \left[\omega^2 - (E_1 + E_1)^2\right]} \left| (q_{2k})_{12} \right|^2 \qquad (9)$$

Card 1/5

is obtained for the frequencies of the bound states of two quasi-particles. Within the framework of the Nilsson model Eq. (9) can only be solved numerically for a real model. Using the model of an axisymmetrically deformed oscillator potential, the authors attempt to find a solution to this equation. Eq. (9) is represented in the form

$$1 = \varkappa \sum_{\lambda\lambda'} \frac{2\Delta^2 |q_{\lambda\lambda'}|^2}{E_\lambda (4E_\lambda^2 - \omega^2)} + \varkappa \sum_{\lambda\lambda'}{}' \frac{(E_\lambda E_{\lambda'} - e_\lambda e_{\lambda'} - \Delta^2)(E_\lambda + E_{\lambda'})}{2E_\lambda E_{\lambda'} [(E_\lambda + E_{\lambda'})^2 - \omega^2]} |q_{\lambda\lambda'}|^2, \quad (15)$$

The first term is the sum over all transitions without energy change, and the second term is the sum over all other transitions. Since ω is negligible in the latter sum, Eq. (15) can be reduced to

$$1 = \varkappa' \sum_{\lambda\lambda'} \frac{2\Delta^2}{E_\lambda (4E_\lambda^2 - \omega^2)} |q_{\lambda\lambda'}|^2,$$

where

$$\varkappa' = \frac{\varkappa}{1 - \varkappa \sum_{\lambda\lambda'}{}' \frac{E_\lambda E_{\lambda'} - e_\lambda e_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'} (E_\lambda + E_{\lambda'})} |q_{\lambda\lambda'}|^2} \quad (16).$$

27480

Collective excitations of non- S/048/61/025/009/005/007
B104/B102

In quasi-classical approximation, Eq. (16) leads to

$$1 = \varkappa' \frac{4\Delta^2}{\omega^2 \sqrt{\frac{4\Delta^2}{\omega^2} - 1}} \arctan \frac{1}{\sqrt{\frac{4\Delta^2}{\omega^2} - 1}} \sum_{\lambda\lambda'} \left| q_{\lambda\lambda'} \right|^2 \delta(\varepsilon_\lambda); \varkappa' \sim \varepsilon_0 / AR_0^4.$$

The following explicit solutions are obtained from this equation:

$$\omega = 2\Delta \sqrt{\frac{3}{2}} \cdot \sqrt{1 - \varkappa' \sum_{\lambda\lambda'} \left| q_{\lambda\lambda'} \right|^2 \delta(\varepsilon_\lambda)} \quad \text{for } \omega \ll 2\Delta \text{ and}$$

$$\omega = 2\Delta \left\{ 1 - \frac{\pi^2}{8} \varkappa'^2 \left[\sum_{\lambda\lambda'} \left| q_{\lambda\lambda'} \right|^2 \delta(\varepsilon_\lambda) \right]^2 \right\} \quad \text{for } 2\Delta - \omega \ll 2\Delta.$$

An analysis of these solutions indicates that collective excitations with energies much less than 2Δ may exist in deformed nuclei. β- and γ-vibrations are interrelated by

X

Card 3/5

27480

Collective excitations of non- ....

S/048/61/025/009/005/007
B104/B102

$$\frac{\omega_\beta^2}{\omega_\gamma^2} = \frac{\sum\limits_{\lambda\lambda'} \frac{1 - g\left(\frac{\varepsilon_\lambda - \varepsilon_{\lambda'}}{2\Delta}\right)}{\left(\frac{\varepsilon_\lambda - \varepsilon_{\lambda'}}{2\Delta}\right)^2} (q_{22})^2_{\lambda\lambda'}\, \delta(\varepsilon_\lambda)}{\sum\limits_{\lambda\lambda'} \frac{1 - g\left(\frac{\varepsilon_\lambda - \varepsilon_{\lambda'}}{2\Delta}\right)}{\left(\frac{\varepsilon_\lambda - \varepsilon_{\lambda'}}{2\Delta}\right)^2} (q_{20})^2_{\lambda\lambda'}\, \delta(\varepsilon_\lambda)}. \qquad (23)$$

From this relation, it is concluded that the frequencies of β- and γ-vibrations agree within the framework of the model of an axisymmetric oscillator potential. The agreement of the frequencies is closely related to the degeneracy of the levels in the oscillator potential. Finally, the Nilsson model without spin-orbital coupling is briefly discussed. The following values are obtained for the ratio $\omega_\beta/\omega_\gamma$ as a function of $\alpha = 2D\varepsilon_0/\omega_0\Delta$:

α	1.8	2.25	3.0	4.5
$\omega_\beta/\omega_\gamma$	0.90	0.86	0.80	0.72

S. T. Belyayev (Zh. eksperim. i teor. fiz. 39, 1387 (1960)) is mentioned.

Card 4/5

27480

Collective excitations of non- ... S/048/61/025/009/005/007
B104/B102

There are 11 references: 7 Soviet and 4 non-Soviet. The references to English-language publications read as follows: Marumori T., Progr. Theor. Phys., 24, 331 (1960); Baranger M., Phys. Rev., 120, 957 (1960); Perlman I., Proceedings of the International Conference on Nuclear Structure, p. 547, Kingston, Canada, 1960.

X

Card 5/5

DROZDOV, S.I.; ZARETSKIY, D.F.

Effects of pair correlation near closed shells. Zhur. eksp. i teor. fiz. 40 no.1:286-295 Ja '61. (MIRA 14:6)
(Potential, Theory of) (Superconductivity)

22151

S/056/61/040/003/031/031
B112/B214

24.6900

AUTHORS: Zaretskiy, D. F., Novikov, V. M.

TITLE: Nuclear fission by μ-mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 982-983

TEXT: The effect of a meson on nuclear fission can be calculated for the case of rigidly oriented nuclear axes. The energy E_{μ} of a bound meson depends on the deformation parameters of the nucleus. A solution of Schrödinger's equation for a meson in the Coulomb field of the deformed nucleus is required for the determination of E_{μ}. It is assumed in the present paper that the nucleus has the form of an ellipsoid of rotation up to its saddle point. The Coulomb potential of a homogeneously charged ellipsoid of rotation with the semiaxes a and b has the form:

Card 1/3

22151

S/056/61/040/003/031/031
B112/B214

Nuclear fission by...

$$\varphi(a,\beta)=\frac{Ze}{c}\Big\{[1-P_2(\mathrm{ch}\,\alpha)P_2(\cos\beta)]\ln\mathrm{cth}\frac{\alpha_0}{2}+\frac{3}{2}\frac{\mathrm{ch}^2\alpha}{\mathrm{ch}\,\alpha_0}P_2(\cos\beta)+$$
$$+\frac{3}{4}\Big(1-\frac{\mathrm{sh}^2\alpha}{\mathrm{sh}^2\alpha_0}\Big)\frac{\sin^2\beta}{\mathrm{ch}\,\alpha_0}\Big\}\qquad \text{for } \mathrm{ch}\,\alpha\leqslant\mathrm{ch}\,\alpha_0=\frac{a}{c},$$
$$\varphi(a,\beta)=\frac{Ze}{c}\Big\{[1-P_2(\mathrm{ch}\,\alpha)P_2(\cos\beta)]\ln\mathrm{cth}\,\frac{\alpha}{2}+\frac{3}{2}\mathrm{ch}\,\alpha P_2(\cos\beta)\Big\}\qquad(1)$$
$$\text{for } \mathrm{ch}\,\alpha\geqslant\frac{a}{c},$$

Here, Ze is the nuclear charge, $c^2=a^2-b^2$, P is the Legendre polynomial, and α,β are the degenerate elliptical coordinates. The Schrödinger equation for a bound meson in a nuclear field with such a potential was solved numerically with the help of an electronic computer. The value of $E_{\mathrm{thresh.}}$ for different values of a/b is given in the following table (U^{238} nucleus):

a/b =	1.2	1.4	1.6	1.8	2	2.2	2.5
E_μ(Mev) =	11.89	11.78	11.66	11.53	11.36	11.21	11.01

The increase ΔE of the fission barrier for some nuclei is given in another table:

Card 2/3

22151

S/056/61/040/003/031/031
B112/B214

Nuclear fission by...

Nucleus	a/b statistical	a/b saddle point	$E_{threshold}$, Mev	ΔE, Mev
U^{238}	1.30	2.24	5.8	0.6
U^{235}	1.25	2.2	5.75	0.6
Pu^{239}	1.30	2.17	5.48	0.5

D. P. Grechukhin is thanked for his advice and V. K. Saul'yev for setting up the program and calculation with the electronic computer. There are 2 tables and 7 references: 2 Soviet-bloc and 3 non-Soviet-bloc.

SUBMITTED: January 11, 1961

Card 3/3

ZARETSKIY, D.F.; NOVIKOV, V.M.

Excitation of nuclei in heavy μ-mesic atoms. Zhur.eksp.i teor.fiz. 41 no.1:214-221 Jl '61. (MIRA 14:7)
(Nuclei, Atomic)

ZARETSKIY, D.F.; URIN, M.G.

Nature of collective levels in nonspherical nuclei. Zhur.eksp. i teor.fiz. 41 no.3:898-906 S '61. (MIRA 14:10)

1. Moskovskiy inzhenerno-fizicheskiy institut.
(Nuclei, Atomic)

ZARETSKIY, D.F.; URIN, M.G.

Microscopic description of collective levels of nonspherical nuclei. Zhur. eksp. i teor. fiz. 43 no.3:1021-1030 '62. (MIRA 15:10)

1. Moskovskiy inzhenerno-fizicheskiy institut.
(Quantum theory) (Nuclie, Atomic)

S/056/62/042/001/046/048
B154/B112

AUTHORS: Zaretskiy, D. F., Urin, M. G.

TITLE: Low levels with negative parity in nonspherical nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 1, 1962, 304-305

TEXT: In deformed even-even nuclei, low levels with 0.3-1.3 Mev were recently detected (Ref. 1). These 1^- levels correspond to internal excitations with K = 0 and negative parity. They cannot be explained by the hydrodynamic model. Therefore, it was proposed that such levels should be interpreted in terms of the superfluid model. Using the method of approximate second quantization in the same way as in Ref. 1 (Zaretskiy, D. F., Urin, M. G., ZhETF, 41, 398, 1961), the excitation energy ($\hbar = 1$) is found to be

$$1 = \varkappa \sum_{\lambda\lambda'} {}_{n,\,p} |(q_{30})_{\lambda\lambda'}|^2 \frac{E_\lambda E_{\lambda'} - \varepsilon_\lambda \varepsilon_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}} \frac{E_\lambda + E_{\lambda'}}{(E_\lambda + E_{\lambda'})^2 - \omega^2} \quad (1),$$

Card 1/5

S/056/62/042/001/046/048
B154/B112

Low levels with negative ...

where $q_{30} = r^3 \cdot Y_{30}(\theta)$ is the single operator for the octupole moment; $E_\lambda = \sqrt{\varepsilon_\lambda^2 + \Delta^2}$. The energy ε_λ is substracted from the Fermi surface; $\Delta = \Delta_n(\Delta_p)$ is a constant characterizing the energy of proton (neutron) pair correlation; $\varepsilon_o^n = \varepsilon_o^n(\varepsilon_o^p)$ is the energy of the Fermi boundary for neutrons (protons); $\varkappa \sim \varepsilon_o/AR^6$ is constant depending on the octupole-octupole interaction. The value of $\varkappa$ is proposed to be the same for nn, pp, and np interactions. (1) permits two solutions which, at $\varkappa \to 0$, correspond to the dissociation of a neutron or a proton pair. For a given group of nuclei, $\varkappa$ can be regarded as constant. If $\varkappa$ is therefore determined for one group of nuclei from the position of the 1^- level, it will be possible to estimate ω from Eq. (1) for the other nuclei of this group. The probability of electric dipole transition from the 1^- level to the ground level is expressed by

Card 2/5

S/056/62/042/001/046/048
B154/B112

$$B(E1;\,1^-\rightarrow 0^+) = \frac{1}{6\omega}\left\{\sum_{\lambda\lambda'}\sum_{n,p} e_{n,p}\,(q_{10})_{\lambda\lambda'}\,(q_{30})_{\lambda\lambda'}\,\frac{E_\lambda E_{\lambda'} - \varepsilon_\lambda\varepsilon_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}}\,\frac{E_\lambda + E_{\lambda'}}{(E_\lambda + E_{\lambda'})^2 - \omega^2}\right\}^2 \times \left\{\sum_{\lambda,\lambda'}\sum_{n,p}\left|(q_{30})_{\lambda\lambda'}\right|^2\frac{E_\lambda E_{\lambda'} - \varepsilon_\lambda\varepsilon_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}}\,\frac{E_\lambda + E_{\lambda'}}{[(E_\lambda + E_{\lambda'})^2 - \omega^2]^2}\right\}^{-1} \quad (2),$$

where $e_n = -Ze/A$, $e_p = Ne/A$, e is the proton charge, and Z(N) is the number of protons (neutrons). In quasiclassical approximation, the authors estimate B(E1) for low 1^- levels ($\omega \ll 2\Delta_{n,p}$) according to (Ref. 4):

$$\sum_{\lambda,\lambda'}\left|(q_{30})_{\lambda\lambda'}\right|^2\frac{E_\lambda E_{\lambda'} - \varepsilon_\lambda\varepsilon_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}(E_\lambda + E_{\lambda'})^3} \approx \frac{1}{4\Delta^2}\sum_{\lambda\lambda'}\left|(q_{30})_{\lambda\lambda'}\right|^2\varphi\left(\frac{\varepsilon_\lambda - \varepsilon_{\lambda'}}{2\Delta}\right)\delta(\varepsilon_\lambda) \sim \rho_0 R^6\Delta^{-2}, \quad (3),$$

where $\varphi(x) = x^{-2} - \ln(x + \sqrt{1 + x^2})\cdot\left[x^3\sqrt{1 + x^2}\right]^{-1}$, and φ_0 is the level energy ✓

density near the Fermi surface. For the approximation in (3), $\mathcal{E}_{\lambda} - \mathcal{E}_{\lambda'} \lesssim 2\Delta$ is necessary. From the Nilson scheme it follows that in the observed nuclear quadrupole deformations β_0 there are levels λ, λ' for which this condition is satisfied. Analogous evaluation of the numerator in Eq. (2) leads to

$$B(E1,\ 1^- \to 0^+) \sim \left(\frac{N-Z}{A}\right)^2 (eR)^2 \beta_0^2 \rho_0 \Delta \frac{2\Delta}{\omega} \qquad (4).$$

In the model considered, the probability for the excitation of the 3^- level is

$$B(E3,\ 0^+ \to 3^-) = \frac{1}{2\omega}\left\{\sum_{\lambda\lambda'}{}' {}_{p} \,|(q_{30})_{\lambda\lambda'}|^2 \frac{E_\lambda E_{\lambda'} - e_\lambda e_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}} \frac{E_\lambda + E_{\lambda'}}{(E_\lambda + E_{\lambda'})^2 - \omega^2}\right\}^2 \times \qquad (5).$$
$$\times \left\{\sum_{\lambda\lambda'} {}_{n,\,p} \,|(q_{30})_{\lambda\lambda'}|^2 \frac{E_\lambda E_{\lambda'} - e_\lambda e_{\lambda'} + \Delta^2}{2E_\lambda E_{\lambda'}} \frac{E_\lambda + E_{\lambda'}}{[(E_\lambda + E_{\lambda'})^2 - \omega^2]^2}\right\}^{-1}.$$

This relation is obtained without introduction of the effective nucleonic charge for the E3 transition. Estimating $B(E3,\ 0^+ \to 3^-)$ in analogy to (3)

S/056/62/042/002/032/055
B108/B104

AUTHORS: Zaretskiy, D. F., Novikov, V. M.

TITLE: Excitation of collective nuclear levels in heavy μ-mesic atoms

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 511 - 519

TEXT: The excitation probability of low collective levels with spin 2^+ which depends on the magnitude of the nuclear quadrupole moment and on the quadrupole transition probability for the level in question is discussed for heavy mesic atoms. Not only a passing 2p muon but also a 3d muon may excite the rotational levels of heavy Th or U type nuclei. The interaction part of the Hamiltonian of the nucleus-muon system is ascribed to quadrupole interaction of the levels $2p_{1/2}$ and $2p_{3/2}$ only. Results of the calculations given in Table 1 indicate that the excitation probability W_{2^+} depends on the nature of the collective level. W_{2^+} is increased, however, by some 20% owing to $3d_{3/2}$ and $3d_{5/2}$ muon states. The latter can

also lead to the excitation of the 4^+ level. The excitation probability W_{4^+}, however, is much more sensitive to the sign of the quadrupole moment than is W_{2^+}. The hyperfine splitting of the excited nuclear levels owing to the interaction between the magnetic moments of the muon and of the excited nucleus is calculated. The finite size of the nucleus has to be considered. For Th^{232} and U^{238}, ΔE = 840 ev. The additional depolarization of muons owing to the transfer of polarity to a nucleus with excited collective levels is also discussed. However, this effect may be masked by the effect of the electron shell. The circular polarization of gammas from the 2p - 1s transition may give information about the additional depolarization of the muons. The effects of quadrupole interaction may also have an effect upon the shape of the muon transition lines. In general, the effect of quadrupole excitation of collective levels in heavy mesic atoms may be masked by radiationless excitation. The latter effect may be estimated by studying the nuclear transitions $4^+ \rightarrow 2^+$ and $2^+ \rightarrow 0^+$ with respect to the occurring gamma quanta from the muon transition. There are 1 figure, 4 tables, and 13 references: 8 Soviet and 5 non-Soviet.

The four references to English-language publications read as follows: Jacobson. Phys. Rev., 96, 1637, 195[illegible]; 42, [illegible] M. Shmushkevich. Nucl. Phys., 11, 419, 1959; A. Z. Dolginov. [illegible] M. Van Patter. Nucl. Phys., 14, Nucl. Phys., 7, 569, 1958.

SUBMITTED: August 8, 1961

Table 1. Results.

Legend: (1) nucleus; (2) parameter of axial symmetry; (3) spin-orbital splitting; (4) energy of the 2^+ level; (5) excitation probability.

Ядро (1)	$B(E2)\cdot10^{48}$ см^4 $0\to2$	(2) γ, град	$\frac{\lvert Q_0\rvert^2}{B(E2)_{0\to2}}$	ΔE, MeV (3)	E_{2^+}, MeV (4)	W_{2^+} (5)
W^{184}	356	15,8	3,86	0,134	0,123	0,40*
Os^{190}	255	22,3	2,66	0,147	0,187	0,30
Hg^{198}	113	24,3	1,90	0,162	0,411	0,025

40429

S/056/62/043/003/043/063
B108/B102

24.4400

AUTHORS: Zaretskiy, D. F., Urin, M. G.

TITLE: Microscopic description of collective levels of nonspherical nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 1021 - 1030

TEXT: When pair correlations of nucleons are considered by the method of Bogolyubov's canonical transformation this leads to unphysical states. Here the structure of such collective states in deformed nuclei is studied by second quantization approximation (cf. ZhETF, 41, 898, 1961). In this case the Hamiltonian for the collective excitations is represented in a diagonalized form wherefrom the collective unphysical state can be eliminated. The unphysical states of the form $A^{+}_{11}|C_0\rangle$ are orthogonal to all physical (real) states. The error which results from simplifying the Hamiltonian $H = H_0 + H_Q + H_{int}$ to collective oscillations is of the order of $(\varrho_0\Delta)^{-1} \ll 1$ where Δ is a constant determining the pairing energy

Card 1/3

Microscopic description of... S/056/62/043/003/043/063
B108/B102

and ϱ_0 is the energy density of the single-nucleon levels near the Fermi level. The matrix element of the electrical multipole moment for a transition between ground state and excited state with multipolarity λ and projection K of the moment has the form

$$\langle\lambda K|Q^{el}_{\lambda K}|0\rangle^2=\left[e\sum_{1,2}^{p}|(q_{\lambda K})_{12}|^2 I_{12}(\omega_{\lambda K})\right]^2\left\{\omega_{\lambda K}\sum_{1,2}^{n,p}|(q_{\lambda K})_{12}|^2 J_{12}(\omega_{\lambda K})\right\}^{-1}, \quad (24)$$

with $J_{12}(\omega^2) = \partial I_{12}/\partial\omega^2$; $I_{12}(\omega_{\lambda K}) = (E_1E_2-\varepsilon_1\varepsilon_2+\Delta^2)E_{12}/2E_1E_2(E_{12}^2-\omega_{\lambda K}^2)$; $E_\nu = \sqrt{\varepsilon_\nu^2+\Delta^2}$, $E_{12} = E_1 + E_2$, ε_ν is the single-nucleon state energy. In the case of β-excitations, Eq. (24) determines the reduced $E\lambda$-transition probability $B(E\lambda)\sim B_{sp}(E\lambda)\varrho_0\Delta 2\Delta/\omega_{\lambda K}$ with an accuracy of $\sim\beta_0^2$ where β_0 is the equilibrium deformation of the nucleus and B_{sp} is the reduced single-particle transition probability.

Card 2/3

ZARETSKIY, D. F.; LUSHNIKOV, A. A.

"Applications of the Theory of the Fermi Liquid to Nuclear Photoabsorption."

report submitted for All-Union on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

IAE (Inst Atomic Energy)

MIGDAL, A. B.; LUSHNIKOV, A. A.; ZARETSKIY, D. F.

"Theory of nuclear dipole photoabsorption."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

Kurchatov Inst, Moscow.

ZARETSKIY, D.F.; URIN, M.G.

Oscillations of nonspherical nuclei. Izv. AN SSSR. Ser. fiz. 28 no.1:118-126 Ja '64. (MIRA 17:1)

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965,

ABSTRACT: The conditions are investigated, under which a gamma quantum radiated by one of the nuclei without recoil (Mossbauer effect) can be absorbed by another nucleus of the same type, so that the excitation (nuclear exciton) can propagate over an entire host crystal consisting of excited and unexcited nuclei of the same type. It is shown that when a nuclear exciton is produced, the main characteristics of spontaneous emission change markedly, because singular anisotropy appears and the gamma quantum flux is concentrated predominantly in the direction of the reciprocal-lattice vector. The emission probability in this direction is

Card 1/2

L 24817-65

ACCESSION NR: AP5004413

4

estimated to be approximately equal to the square of the effective number of nuclei. It is also shown that the formation of a nuclear exciton is connected with an increase in the width of the emitting level by a factor proportional to the cube root of the number of effective nuclei. It is thus possible to obtain sharply directional beams of monochromatic gamma quanta and the lifetimes of the nuclear isomers can be greatly reduced when such isomers are placed in a crystal consisting of unexcited nuclei of the same sort. "We thank F. L. Shapiro for valuable remarks and also V. K. Voytovetskiy and S. M. Feynberg for discussions." Orig. art. has: 10 formulas.

ASSOCIATION: Institut atomnoy energii (Insititute of Atomic Energy)

SUBMITTED: 28Jul64 ENCL: 00 SUB CODE: SS, OP

NR REF SOV: 004 OTHER: 003

Card 2/2

L 2752-66 EWT(m)/T/EWA(m)-2
ACCESSION NR: AP5024345 44,55 UR/0367/65/002/002/0307/0314

AUTHOR: Zaretskiy, D. F.; Ivanter, I. G. 44,55

46
B

TITLE: The four-fermion interaction and baryon masses

SOURCE: Yadernaya fizika, v. 2. no. 2, 1965, 307-314 19,44,55

TOPIC TAGS: particle symmetry, unitary symmetry, group theory, strong nuclear interaction, baryon, fermion, particle physics

ABSTRACT: A simple dynamic model is proposed for interpreting the mass spectrum of baryons (octet and decuplet). The mathematical analysis is based on a Hamiltonian with strong four-fermion interaction, which corresponds to a scalar and to the eighth component of an 8-vector *SU*(3) representation. The four-fermion interaction is made up of strongly interacting baryon currents. This model is used as a basis for determining the relationship between splitting of the masses of the baryons in the octet and corresponding splitting in the decuplet. Orig. art. has: 32 formulas.

ASSOCIATION: none
SUBMITTED: 30Dec64 ENCL: 00 SUB CODE: NP, MA
NO REF SOV: 002 OTHER: 016

Card 1/1

SHAPIRO, I.S.; ZARETSKIY, D.F.; LUSHNIKOV, A.A.

[Nuclear physics; the mechanism underlying nuclear reactions] IAdernaia fizika; mekhanizm iadernykh reaktsii. Moskva, AN SSSR, 1965. 88 p. (MIRA 18:10)

1. Akademiya nauk SSSR. Institut nauchnoy informatsii.

L 36377-66 EWT(m)/T SOURCE CODE: UR/0367/66/003/002/0263/0267

ACC NR: AP6017590

58
57
B

AUTHOR: Zaretskiy, D. F.; Lomonosov, V. V.

ORG: none

TITLE: Concerning certain features of the radiation of gamma quanta from nuclei in a crystal lattice

SOURCE: Yadernaya fizika, v. 3, no. 2, 1966, 263-267

TOPIC TAGS: gamma radiation, excited nucleus, nuclear isomer, nuclear energy level, crystal lattice structure, line width, spectral distribution, angular distribution

ABSTRACT: This is a continuation of earlier work by the authors (ZhETF v. 43, 368, 1965) where it is shown that under certain conditions collective nuclear excitation (nuclear exciton) can exist in an ideal single crystal, and that this exciton has a decay width which differs noticeably from the natural width of the nuclear level. The present article is devoted to a study of the singularities of radiative decay of nuclear levels in the case when the conditions for the existence of a nuclear exciton are present, and to a study of the spectral and angular distribution of the gamma-quantum flux in this case. To this end, one of the methods of generation of nuclear collective excitation and the effects associated with it is investigated, and the radiation from a recoilless nucleus placed in a definite crystal lattice point is determined. This recoilless nucleus is assumed for simplicity to be a two-level isomer. All the nuclei in the crystal are assumed to be of the same kind as the radiating

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001963820010-1"

L 36377-66

ACC NR: AP6017590

nucleus, and line splitting is neglected. From the equations of motion the authors determine the amplitude of the state corresponding to the case when the isomer is excited but the other nuclei are not, the time dependence of the decay probability of the isomer, and the spectral and angular distribution of the gamma quanta emitted under definite relations between the wavelength of the radiation and the lattice constants. The results are extended to a three-level isomer and to radiation of more than one nucleus in the crystal. It is concluded that the existence of the nuclear exciton can be ascertained by observation of the spectral and angular distribution of the gamma-quantum flux when the condition K = 2πb is satisfied (K - wave vector of the radiation, b - reciprocal lattice vector). The authors thank V. K. Voytovetskiy for useful discussions. Orig. art. has: 16 formulas.

SUB CODE: 20/ SUBM DATE: 08Jan65/ ORIG REF: 002/ OTH REF: 001

Card 2/2

The effect of deformation on the corrosion of metals. E.M. Zaretskii. J. Applied Chem. U.S.S.R. 24, 521-8(1951)(Engl. translation).

See C.A. 46, 4984a. B.R.

immediate source clipping

Influence of Deformation on the Corrosion of Metals. (In Russian.) [illegible] Zarotskii. Zhurnal Prikladnoi Khimii, v. 24, May 1951, p. 477-484.

See abstracts of parts I and II, Chemical Age; items 544-% and 583-R, 1951.
(R general, R11, 424, Al, Zn, Cu, ST)

Immediate Source Clipping

ZARETSKII, E. M.

RT-1237 [A mechanism of corrosive cracking in magnesium alloys] Abstracted from:
O mekhanizme korrozionnogo rastreskivaniia magnievykh splavov.
Doklady Akademii Nauk SSSR, 58 (4): 607-610, 1947

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

M

4

"The Co[illegible] of Copper in Aqueous Solutions of Ammonium Compounds. I.—The Mechanism of Corrosion of Copper in Solutions of Ammonium Compounds. E. M. Zaretskiy and G. V. Akimov (*Zhur. Priklad. Khimii* (*J. Applied Chem.*), 1938, 11, (7/8), 1161–1171).—[In Russian.] The corrosion of copper was studied in 0·0001*N*–3*N* solutions of NH_4OH and NH_4Cl. Solutions below 0·001*N* were practically non-corrosive, corrosion increasing rapidly in more concentrated solutions, the more so in the case of NH_4OH than NH_4Cl. There was practically no corrosion in the absence of air. Corrosion involves electrochemical solution of copper as cuprous ammonium complex, oxidation of the latter in solution to the cupric compound, followed by reduction of the latter to the cuprous compound at local cathodes on copper surfaces, with accompanying solution of copper. These deductions were confirmed and amplified by measurements of current and effective potential of a copper platinum cell. The solution potential of copper in NH_4OH and NH_4Cl solutions becomes more negative as the concentration of the solution is increased, the effect being greater in NH_4OH solutions.—A. B.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

Met. abstract

6

*Corrosive Cracking of Magnesium Alloys.—I.-II. E. M. Zaretsky (Zhur. Priklad. Khim., 1947, 20, 823-829, 830-836; Brit. Abs., 1948, [BI], 493).—(In Russian). [I.—] Sheets of pure Mg and rolled alloy MA-1 (contg. 1·22% Mn) do not exhibit fissuring after exposure to atmospheric conditions. MA-3 alloy (5·8% Al) develops cracks when exposed to the weather under elastic stress, the time required for the cracks to appear increasing from 1 day under a load of 16 kg./mm.^{2} to 32-43 days under a load of 2·1 kg./mm.^{2}. These cracks spread rapidly, passing through crystallites as well as along their boundaries. Cracking cannot be prevented by chem. or electrolytic oxidation of the surface, or by mech. or thermal treatment of the alloy. [II.—] Cast Mg or MA-3 alloy sheets do not crack during weathering under elastic stress. MA-6 alloy (10% Al) cracks readily under these conditions, but this effect mostly disappears after annealing at 420° C. for 3 hr., and quenching in H_2O.

BI-6, Non-ferrous metallurgy

Br. Abs.

Corrosive cracking of magnesium alloys. L. II. E. M. Zaretsky (J. appl. Chem., USSR, 1947, 20, 523—529, 530—536).—I. Sheets of pure Mg and rolled electron alloy MA-1 (containing 1·22% of Mn) do not exhibit fissuring after exposure to atm. conditions. MA-3 alloy (5-6% of Al) develops cracks when exposed to the weather under elastic stress, the time required for development of the cracks rising from 1 day under a load of 16 kg. per sq. mm. to 32—43 days under a load of 2·1 kg. These cracks spread rapidly, passing through crystallites as well as along their boundaries. Cracking cannot be prevented by chemical or electrolytic oxidation of the surface, or by mechanical or thermal treatment of the alloy.

II. Cast Mg or MA-3 alloy sheets do not crack during weathering under elastic stress. MA-6 alloy (10% of Al) cracks readily under these conditions, but this effect mostly disappears after annealing at 420° for 3 hr., and quenching in H_2O. R. Truscoe.

BC A-1

Corrosion of copper in aqueous ammonium salts. I. Mechanism of corrosion. E. M. Zaretskii and G. V. Akimov (J. Appl. Chem. Russ., 1938, 11, 1161—1172).—Cu is not corroded by aq. NH_3 or NH_4Cl in absence of O_2. In its presence corrosion consists of 3 successive processes: (i) dissolution of Cu, with formation of Cu_2O-NH_3 complexes (corrosion with O_2 depolarisation), (ii) oxidation of Cu^I to Cu^{II}, and (iii) electrochemical reaction of the Cu^{II} complex with Cu, to regenerate the Cu^I complex. Reaction (iii) constitutes a separate cycle, and is chiefly responsible for corrosion; during this part of the process the Cu becomes strongly electronegative. The corrosive action of aq. NH_3 is > of NH_4Cl; the velocity of reaction $\propto$ $[NH_3]$ in the former case, and is max. in N-NH_4Cl in the latter. The relatively weaker action of NH_4Cl is ascribed to instability of the Cu complexes in its presence.
R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

9

The effect of deformation on the corrosion of metals. E. M. Zaretskii. *J. Applied Chem. U.S.S.R.* 24, 821-8 (1951)(Engl. translation).—See *C.A.* 46, 4984a. B. R.

MR

R

244-R. **Influence of Deformation on the Corrosion of Metals.** (In Russian.) E. M. Zaretskii. *Zhurnal Prikladnoi Khimii*, v. 24, May 1951, p. 477-484.

See abstracts of parts I and II, *Chemical Age*: items 344-R and 368-R, 1951.

(R general, R11, Q24, Al, Zn, Cu, ST)

Met. Rev.
1952

P. Physical Properties
And Test Methods

106-P. The Influence of Deformation on the Potentials of Metals. (In Russian.) E. M. Zaretskii. *Zhurnal Prikladnoi Khimii*, V. 24, June 1951, p. 614-623.

See abstract of "Deformation and Corrosion", *Chemical Age*; Items 344-R and 368-R, 1951.
(R11, Q24, Mg, Al, Cu, Zn, ST)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

The mechanism of removal of oxides in the process of steel etching by acids. V. O. Krenig and E. M. Zaretskii. *Korroziya i Borba s Nei* 5, No. 3-4, 9-18(1939).—To prove the electrochem. nature of the process of etching, expts. were made with the aid of a microelement, one electrode of which was made of steel and the other of the oxidized sample having the general formula Fe_xO_y. The steel, Cromansil, contained C 0.3, Cr 1.01, Mn 1.01, Si 0.87, P 0.035 and Cu 0.13%. The oxides formed on this steel contain about 96.8% Fe_2O_3 + Fe_3O_4, 1.4% of FeO and 1.2% of metallic Fe. As the process goes on the potential of the anode changes very little. During the first 10 min. a strong polarization takes place; then the potential of the cathode rises to a value slightly above the initial one; finally it drops again, almost reaching the value of the anode potential. Both the anode and the cathode undergo losses in weight. During the first two hrs. evolution of H was observed only on the anode. Then bubbles began to appear on the cathode accompanied by sepn. of the oxide film from the Fe all along the cathode surface. By that time the current strength fell almost to zero. FeO becomes completely dissolved and metallic Fe decreases to 0.1%. After etching the magnetic properties of the oxide crust have almost disappeared, which means that Fe_3O_4 was largely reduced during the process, while Fe_2O_3 remained practically unchanged. The mechanism of etching can be represented as follows: On the anode Fe^{++} ions are formed. On the microcathode regions of the anode the H^+ ions become discharged. On the cathode the H^+ ions also become discharged but in the presence of the Fe_3O_4 they react to form FeO, which dissolves in the acid. The velocity of this reaction is less than that of the H-ion discharge. Therefore, soon H also begins to form and its accumulation causes the polarization of the cathode. Both the cathode potential and the current density drop until the velocities of the two processes become equal. With time the film of Fe_2O_3 disappears in some spots and the acid comes into contact with the underlying film of Fe_3O_4, which has a higher tendency to oxidize. At that moment the cathode potential acquires a positive value, the potential difference and the c. d. increase and the discharged H ions reduce Fe_3O_4 to FeO, which goes into the acid. When most of the Fe_3O_4 is reduced the basic metal, i. e. Fe, becomes exposed to the action of the acid. The situation is the same now as on the anode. Thus on the micro-anode regions of the cathode H bubbles appear and the potential drops back to the same value as on the anode.

C. S. Shapiro

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

PROCESSES AND PROPERTIES INDEX

Comments on the paper of V. S. Zorin. Corrosion process under drops of solutions. ~~E. M. Zaretskii~~. J. Phys. Chem. (U. S. S. R.) 13, 1024-5(1939); cf. C. A. 33, 6213[9]. Reply. V. S. Zorin. Ibid. 1205-6.

F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

**Corrosion of copper in aqueous solutions of ammonium compounds. I. The mechanism of the corrosion. E.
M. Zaretskii and G. V. Akimov. *J. Applied Chem.***

(U. S. S. R.) 11, 1161-71(in French, 1171-2)(1938).—
The corrosion of Cu in solns. of NH_4 compds. is attributed
to three consecutive processes: (1) electrochem. soln. of
Cu with the formation of cuprous-ammonia complex, corre-
sponding to a special type of corrosion processes with the
depolarization of O; (2) chem. oxidation of the complex
formed by the O of the air to cupric-ammonia complex;
and (3) electrochem. reduction of the cupric-ammonia
complex to cuprous-ammonia complex. The soln. of Cu
proceeds energetically in process (3), which together with
(2) forms an independent cycle. Because of inconsider-
able dissocn. of the copper-ammonia complex cation, the
Cu potential shifts strongly to the neg. side and the differ-
ence between anode and cathode reaches a considerable
value. The Cu corrosion is less intensive in NH_4Cl soln.,
presumably because the complex is partially destroyed and
therefore its potential is more pos. and the difference be-
tween the anode and cathode portions is smaller. In the
absence of air, Cu is practically unaffected by corrosion
in the NH_4OH and NH_4Cl solns. The velocity of Cu
corrosion increases with the increase of NH_4OH concn.;
it increases with NH_4Cl concn. to *N* and then decreases
with further increase of the NH_4Cl concn. NH_4Cl soln.
corrodes Cu to a smaller degree than does NH_4OH.

A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

13

14

11553 Deformation & Corrosion. Part II. Aluminium, Zinc, Copper & Steel. *Chemical Age*, v. 65, Sept. 1, 1951, p. 299-300. (Based on paper by E. M. Zaretskii, *Zhurnal Prikladnoi Khimii* [Journal of Applied Chemistry], v. 24, May 1951, p. 477-484.)

Outlines experiments on effects of deforming stresses on corrosion of above materials in different media.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

A

R

6d-8. Corrosion Cracking of Magnesium Alloys. (In Russian). E. M. Zaretskii. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 20, Sept. 1947, p. 8[illegible]-829.

The corrosion resistance of 1-mm. sheet containing 5.62 to 5.84% Al; 0.95% Zn; 0.38% Mn; 0.09% Si, and 0.05% Fe was investigated under conditions of tensile stress and at temperatures from room to 420° in air and in various other media. Attempts to improve stress-corrosion resistance by cold working or heat treatment were unsuccessful.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

A

R

6d-4. Corrosion Cracking of Cast Magnesium Alloys. (In Russian). E. M. Zaretskii. Zhurnal Prikladnoi Khimii (Journal of Applied Chemistry), v. 20, Sept. 1947, p. 830-840.

Stress-corrosion resistances of cast magnesium, of the alloy mentioned in the preceding abstract, and of another one containing 10% Al, 0.20% Mn, 0.04% Fe, and 0.99% Si, were investigated. The first was not sensitive to stress-corrosion; the cast form of the second, contrary to the cold worked form, is also not sensitive; the latter cast alloy has a slight tendency toward stress-corrosion, which can be eliminated by proper heat treatment and quenching procedure.

AS M

T

24[illegible]-R. **Influence of Deformation on the Corrosion of Metals.** (In Russian.) E. M. Zaretskii. *Zhurnal Prikladnoi Khimii*, v. 24, May 1951, p. 477-484.

See abstracts of parts I and II, *Chemical Age;* items 344-R and 368-R, 1951.

(R general, R11, Q24, Al, Zn, Cu, ST)

B

14

PROCESSES AND PROPERTIES INDEX

*123. **Corrosion Cracking of Magnesium Alloys.** (In Russian.) E. M. Zaretskii. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 20, Sept. 1947, p. 823-829.

The corrosion resistance of 1 mm. sheet containing 5.62-5.84% Al; 0.95% Zn; 0.38% Mn; 0.09% Si, and 0.05% Mg was investigated under conditions of tensile stress and at temperatures from room to 420° in air and in various other media. Attempts to improve stress-corrosion resistance by cold working or heat treatment were unsuccessful.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

B

14

•124. **Corrosion Cracking of Cast Magnesium Alloys.** (In Russian.) E. M. Zaretskii. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 20, Sept. 1947, p. 830-840.

Stress-corrosion resistances of cast Mg, of the alloy mentioned in the above abstract, and of another one containing 10% Al; 0.20% Mn; 0.04% Fe, and 0.09% Si were investigated. The first was not sensitive to stress corrosion; the cast form of the second, contrary to the cold-worked form, is also not sensitive; the latter cast alloy has a slight tendency toward stress corrosion, which can be eliminated by proper heat treatment and quenching procedure, which is described. The mechanism of stress corrosion in cold-worked and cast Mg alloys is explained. 12 ref.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA 9

Effect of deformation on the corrosion of metals. E. M. Zaretskii. *Zhur. Priklad. Khim.* (J. Applied Chem.) 24, 177-84(1951).—Test strips of rolled and annealed Mg alloys with (I) 1.68% Mn, (II), Al 0.16, Ce 0.35, Mn 1.67%, (III) Al 5.62, Zn 0.06, Mn 0.33, Ni 0.17%, and 1 mm. thick steel C 0.10, Mn 0.32, Si 0.16, Ni 0.15, Cr traces; 3 mm. thick Cu; 3 mm. thick Zn; and 2 mm. thick Al were subjected to known tensile stresses σ, and the degree of corrosion was detd. by the loss of wt. in 24 hrs. With I, stress (up to 90% of the limit) had no effect on the corrosion in a 0.1 *M* NaCl soln. (buffered to pH 6.8); in atm. exposure, corrosion first decreases with increasing σ, passes through a min. (at about σ = 40%), then increases. With III, in 0.1 *M* NaCl, the corrosion passes through a low max., then falls to about the same value as with the unstressed metal. With II, corrosion increases slightly with σ, both in NaCl and in atm. exposure. On the whole, stress has but little effect on the corrosion of these Mg alloys; they are highly resistant to corrosion in exposure to an industrial atm., the loss of tensile strength of 1 mm. thick strips in 2 years having been 5, 15, and 20% only for I, II, and III, resp. The corrosion of stressed Al in 0.3 *M* HCl increases with σ up to about 20%, then remains const.; in 0.5 *M* NaCl, it is const. up to about σ = 70%, then increases (in 120 days expts.). With Zn in 0.0125 *M* H_2SO_4, the loss of wt. increases with σ; the loss of tensile strength first decreases, remains const. between σ = 10 and 50%, then increases. With Cu in 0.1 *M* $(NH_4)_2SO_4$, buffered to pH 2, the corrosion decreases somewhat with increasing σ; in 0.005 *M* H_2SO_4, stress has no effect on the corrosion. With steel in 1.5 *M* H_2SO_4, the corrosion increases with σ only very slightly, more significantly at σ = 70-90%. N. T.

CA 9

Corrosional cracking of Electron alloy AZM in various media. K. M. Zatelakil. *Doklady Akad. Nauk S.S.S.R.* 58, 77-9(1947).—The alloy (Mg with 6% Al, 1 Zn, 0.5 Mn) was examd. in H_2SO_4, Na_2CO_3, and $NaCl-K_2Cr_2O_7$ solns. Small concns. of H_2SO_4 accelerate cracking type of corrosion, possibly by accentuated potential differences between the anodic zones and the rest of the material; in 0.4 *N* and higher acid general corrosion predominates. In carbonate solns. soln. of anodic zones always exceeds that of general corrosion and cracking always takes place. Dichromate accelerates cracking-corrosion by several hundred fold when added to NaCl soln.; the max. effect occurs at about 0.025 *M*. G. M. K.

Ca

Corrosive cracking of magnesium alloys. I. E. M. Zaretskii. *J. Applied Chem.* (U.S.S.R.) 20, 823-9 (1947)(in Russian).—Stress-corrosion tests were run on the Mg alloys Electron MA-3 (Al 5.84, Zn 1.10, Mn 0.38, Si 0.14, Fe 0.02), Electron MA-1 (0.15, 0, 1.22, 0.06, 0.01), and Mg (0.33, 0.07, 0.03, 0.02, 0.05), annealed at 420° and etched, in the form of rolled ribbons 1 mm. thick, 15 mm. wide, 100 mm. long, bent into loops of radius 8 mm. and subjected to different known stresses by pulling together or apart the ends of the loop. In atm. exposure, the 1st crack appeared, in MA-3, after 1-2 days under 15.0 kg./sq. mm., after 5-10 days under 6.8, none after 300 days without stress. Similar effects, but after longer times, were observed in immersion in distd. H_2O, and, even more slowly, in a tap-water spray. Under the same conditions, general (non-stress) corrosion was insignificant; nor did any cracking occur in samples bent (plastically) into a loop but not subjected to an elastic stress. In distd. H_2O, in the absence of O_2, the tendency to stress corrosion is decreased markedly. The aspect of stress corrosion is very different from ordinary corrosion; the surface of cracked samples often remained bright. On micrographs, stress-corrosion cracks are seen to pass both along boundaries of grain and through the grains. Annealing followed by cooling under different conditions, and tempering, had little influence on the time of appearance of stress-corrosion cracks. Chem. surface treatments retarded somewhat the appearance of the 1st crack without, however, preventing it seriously. Relatively best results were obtained by anodic oxidation in a soln. $K_2Cr_2O_7$ 100 + NaH_2PO_4 50 g./l. Surface treatment with steel balls was of no avail. The MA-1 alloy and Mg are not subject to stress corrosion.

II. Corrosive cracking of cast magnesium alloys. *Ibid.* 830-6.—(1) In samples 100 × 15 × 3 mm., cut from metal cast in sand at 730-50° and etched, bent under known loads, Mg showed no stress corrosion. Likewise, and in contrast to its behavior in the rolled state, cast MA-3 proved to be resistant; the 1st crack, under 11 kg./sq. mm., appeared in atm. exposure only after 20 days, none in 300 days under smaller stresses. In tap-water spray, the 1st crack appeared, under 11 kg./sq. mm., after 10 months, and only microcracks were found under 9 kg./sq. mm. A much more marked tendency to stress corrosion was found with cast MA-6 (Al 10.0, Zn 0, Mn 0.20, Fe 0.04, Si 0.09), the 1st crack, in atm. exposure, appearing within 2-20 days under 2.5-8.0 kg./sq. mm.; the cracks are mainly along grain boundaries. In tap-water spray, the alloy is highly resistant, no surface cracks being visible in 10 months, only microscopic intercryst. corrosion with crumbling of single crystal grains. Immersion in distd. H_2O causes much more rapid stress corrosion than water spray. Coating with gun grease prevented stress corrosion for 3 years. (2) In further contrast to the rolled alloys, heat-treatment does have a marked effect on the stress corrosion of cast MA-6. Three hrs. annealing at 420°, if followed by cooling in the furnace, lowers the resistance (the 1st crack appearing in distd. H_2O, in 54 hrs. under 8.2 kg./sq. mm.), but, if followed by quenching in water at 20° or at 100°, it increases the resistance (to 585 hrs.). In samples quenched at 20°, cracking was more pronouncedly intercryst., with crumbling of grains, whereas in samples quenched at 100° the cracks were more nearly oriented in the direction of the stress. The particular sensitivity of the stress-

over

corrosion resistance of the MA-6 alloy to heat-treatment is
linked with the presence of the solid solns. Mg-Mg_4Al_3
and Al-Mg_4Al_3. (3) An attempt is made to classify stress-
corrosion effects in 3 groups. The 1st group comprises
alloys with a tendency to intercryst. corrosion even in the
absence of deformation; imposition of stress only pulls
apart grains already corroded along their boundaries and
facilitates further penetration. In the 2nd group, the
tendency to corrosion appears as a result of sepn. of com-
ponents from a supersatd. solid soln., along grain bound-
aries, under the action of the stress (e.g., Al + 6 Mg +
4 Zn, quenched); in this case, homogenization of the
grains through annealing should counteract stress cor-
rosion. The 3rd group comprises alloys close to equil.
and not subject to intercryst. corrosion in the absence of
stress; here, stress corrosion must be attributed mainly
to the appearance of local potential differences under
the action of the stress. N. Thon

AGRANAT, B.A.; ZARETSKIY, F.I.

Use of ultrasonic waves to prepare a stable drawing emulsion. Sbor. nauch. trud. GINTSVETMET no.33:369-376 '60. (MIRA 15:3)
(Metalworking lubricants)
(Ultrasonic waves—Industrial applications)

S/137/62/000/004/068/201
A052/A101

AUTHORS: Agranat, B. A., Zaretskiy, F. I.

TITLE: Application of ultrasound to the production of a stable drawing emulsion

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 34, abstract 4D197 ("Sb. nauchn. tr. In-t tsvet. met. im. M. I. Kalinina", no. 33, 1960, 369-376)

TEXT: The investigation of the emulsification process acted upon by a strong ultrasonic field was carried out on emulsion of the "Moskabel'" plant. For drawing Cu- and Al-wire the plant used to prepare emulsions by boiling a soap solution and mechanical mixing with oil and water. These emulsions would usually stratify in 5 - 10 days and proved unsuitable for further use. A series of experiments carried out to produce a more stable emulsion by means of ultrasound has shown that the disperisty of the ultrasound treated emulsion changes inconsiderably, and it preserves practically its stability during several months. A description and diagram of the ultrasonic unit for producing emulsion are given.

K. Ursova

[Abstracter's note: Complete translation]

Card 1/1

KOVALENKO, D.N.; ZARETSKIY, G.M.

Bentonites in the Lopushnianskoye deposit. Bent.gliny Ukr. no.3:3-13 '59. (MIRA 12:12)

1. Institut geologicheskikh nauk AN USSR i Ukrainskoye otdeleniye Vsesoyuznogo tresta stroitel'no-tekhnicheskikh izyskaniy.
(Dniester Valley--Bentonite)

SKURKOVICH, S.V.; ZARETSKIY, I.I.

Effect of immunotherapy on kidney function in burns. Khirurgiia 35 no.7:16-21 Jl '59. (MIRA 12:12)

1. Iz patofiziologicheskoy laboratorii (zav. - chlen-korrespondent AMN SSSR prof. N.A. Fedorov) TSentral'nogo instituta gematologii i perelivaniya krovi (dir. - deystvitel'nyy chlen AMN SSSR prof. A.A. Bagdasarov) Ministerstva zdravookhraneniya SSSR.

(BURNS, experimental)
(KIDNEYS, physiology)
(IMMUNE SERUMS, pharmacology)

CA ZARETSKIY, I. I.

Water metabolism after isogenous blood transfusion. I. I. Zaretskii (Ministry Health, Moscow). *Arkh. Patol.* 11, No. 6, 70-9(194[illegible]).—Expts. on dogs with fresh citrated blood (10-15 ml. per kg.) transfusions showed that at first a drop of H_2O content in the recipient's blood occurs (av. 0.20%), which is followed by a rise, reaching 1.49% (av.) above normal in 24-48 hrs. Cl level follows that of H_2O. Erythrocytes participate in the changes involved, as shown by enhanced ability for uptake of H_2O and Cl within 1-2 days after transfusion; individual vols. of erythrocytes increase as H_2O accumulation proceeds. Excretory and secretory processes also go through a decrease-increase cycle (diuresis and gastric secretion measurements). Liver tissue acts as a regulator of the changes which take place. G. M. Kosolapoff

ZARETSKIY, I. I.

35481. Izmenehiye Khimicheskogo i morfologicheskogo sostava Krovi posle perelivaniya izogennoy kvovi. Vracheb. delo, 1949, No. 11, stb, 985-88.

Letopis' Zhurnal'nykh Statey, Vol. 48, Moskva, 1949

ZARETSKIY, I. I.

CA

11 G

Water metabolism in healthy and anemic subjects after blood transfusion. I. I. Zaretskii (Ministry of Health, Moscow). *Terapet. Arkh.* 22, No. 3, 65-8(1950); cf. C.A. 44, 5432f.—The erythrocytes of the recipient take active part in H_2O metabolism in the 1st days after transfusion. They energetically retain H_2O and increase in vol. On the day of transfusion diuresis and elimination of Cl decline, after 24-48 hrs. both rise. Transfusion leads to a temporary (2-6 days) decline in concn. of blood protein (largely globulin). In anemic patients permeability of the capillary endothelium increases. The McClure-Aldrich test is accelerated in the 1st 2-3 days after transfusion.

G. M. Kosolapoff

ZARETSKIY, I. [I.] Candidate of Medical Science

"Problems in Connection with Blood Transfusion"

Meditsinskiy Rabotnik, No. 23, 1950

-W-11691, 5 Jul 1950

ZARETSKIY, I. I.

Present problems in hematology and blood transfusion. Sovet. med. no.9:38-40 Sept 1951. (CLML 21:1)

1. Report on the 29th Expanded Plenary Session of the Learned Council of the Central Order of Lenin Institute of Hematology and Blood Transfusion held in May 1951.

ZARETSKIY, I.I., kandidat meditsinskikh nauk (Moscow).

Certain results and prospects in the development of hematology and blood transfusion. Sov.med. 17 no.8:44-47 Ag '53. (MLRA 6:8)
(Blood--Transfusion)

1953 Session of the Scientific Council, Central Order of Lenin Institute of Hematology and Blood Transfusion

ZARETSKIY, I.I. (Moscow); MIKHAYLOVA, I.A. (Moscow); ROZANOVA, N.S. (Moscow)

Functional state of the kidneys following transfusion of compatible blood. Arkh.pat. 16 no.2:26-31 Ap-Je '54. (MLRA 7:5)

1. Iz patofiziologicheskoy laboratorii (zav. prof. N.A.Fedorov) TSentral'nogo instituta gematologii i perelivaniya krovi, Ministerstva zdravookhraneniya SSSR (dir. chlen-korrespondent AMN SSSR prof. A.A.Bagdasarov).

(BLOOD TRANSFUSION, *eff. on kidney funct.)
(KIDNEYS, physiology, *eff. of blood transfusion)

ZARETSKIY, I. I. and FAYNSHTEYN, F. E.

Some New Experimental and Clinical Data on the Field of Hematology. Voyenno-Meditsinskiy Zhurnal, No 1, p 15, 1955.

FEDOROV, N.A., professor; ZARETSKIY, I.I. (Moskva)

Renal function following blood transfusion; experimental and clinical investigations. Klin.med., 33 no.11:28-36 N '55. (MLRA 9:7)

1. Iz patofiziologicheskoy laboratorii (zav.-prof. N.A.Fedorov) TSentral'nogo instituta gematologii i perelivaniya krovi Ministerstva zdravookhraneniya SSSR (dir.-chlen-korrespondent AMN SSSR prof. A.A.Bagdasorov)
(KIDNEYS, physiology,
eff. of blood transfusion)
(BLOOD TRANSFUSION,
eff. on kidney funct.)

ZARETSKIY, I.I., kandidat meditsinskikh nauk

New trends in the field of hematology and blood transfusion. Voen.-med. zhur. no.6:8-16 Je '56. (MLRA 9:9)
(BLOOD)

USSR / Human and Animal Physiology. Excretion. T

Abs Jour: Ref Zhur-Biol., No 22, 1958, 101947.

Abstract: activity of the tubules according to diodrast or phenol red were determined. The investigations were conducted on the day of transfusion after the emergence of the animals from the state of shock, next day, and later every two days until return to normal. In heterotransfusion and in isotransfusion, a biphase change of the kidney function occurred, sharper in the first case. During the first phase (1-2 days) after blood infusion, the excretory and concentrating powers of the kidneys decreased, glomerulus filtration and the kidney blood circulation decreased, the filtration fraction and permeability of the glomerular membrane increased. This was confirmed by histologic data (edema of the medular layer of the kidneys, edema of the glomerular capsule, constriction of the

Card 2/3

ZARETSKIY, I. I.

VINOKUROVA, G.P.; ZARETSKIY, I.I.; MIKHAYLOVA, I.A.

The effect of blood transfusion, blood components and plasma substitutes on kidney functions. Probl.gemat. i perel.krovi 1 no.2: 48-52 Mr-Ap '56. (MIRA 10:1)

1. Iz TSentral'nogo ordena Lenina instituta gematologii i perelivaniya krovi (dir. - chlen-korrespondent AMN SSSR prof. A.A.Badasarov) Ministerstva zdravookhraneniya SSSR.
(KIDNEYS, physiol.
funct., eff. of blood transfusion, blood components and plasma substitutes)
(BLOOD TRANSFUSION
eff. on kidney funct.)
(PLASMA SUBSTITUTES, eff.
on kidney funct.)